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GEOGRAPHY IN SECONDARY SCHOOL COURSES

IN the JOURNAL for March appeared a series of replies to several questions concerning the field and scope of secondary school geography. The following additional replies should be read with the questions which appeared on page 241 held clearly in mind.

L[2]

I do not believe that the outline should be followed for any considerable part of the course. I have my objections to the high school course in physical geography as outlined in the popular text-books on the subject, on the following conditions and requirements:

1. Pupils enter the high school with a very imperfect knowledge of geography.

2. The pupil who expects to enter practical life from the high school needs to have, as an equipment for life, a foundation of geographic knowledge as broad as possible and yet one that will extend to a detailed knowledge of the geography of European or western civilization.

3. The pupil who expects to enter college from the high school should have clear-cut conceptions of a great number of geographic facts and relations rather than a superficial, theoretical knowledge of geographic, geological or meteorological principles which he has learned from a text or from the teacher.

4. The popular text-books deal with the subject largely from the point of view of geographical physics, rather than from the point of view of geography.

5. The popular text-books place too much emphasis on explanations of phenomena, before a clear conception of the nature of the phenomena has been obtained.

XUM

The first of these statements needs no argument. It is a matter of common knowledge that the student leaves the grades with an extremely crude idea of the earth on which he lives. It has been my experience as a teacher of college students that they do not have any better knowledge when they enter college, even if they have had a course in physical geography in the secondary school.

The young man who does not expect to enter college can not become a *trained* geographer nor can he become *trained* in any subject before he enters practical life. He must seek knowledge therefore in his school course rather than training. Knowledge will be useful to him as an equipment for the practical problems of life. It will be useful as a foundation for the *training* that he may get in the school of life. Knowledge of the earth is geography. It makes no essential difference whether it is called geography or physical geography. The latter is not different in kind from the former. It differs in the broadness or extent of its view. It is, however, a matter of distribution and relations of facts and phenomena.

The pupil does not now get this knowledge in the grade school. There will have to be a great advance in the efficiency of geography teaching above what it is now, if he ever gets it there. Indeed it is extremely probable that the accomplishment of this object is not possible in the grades. It probably needs a more mature mind than the average of grade pupils. However that may be, the present condition is the fact that must be considered now. In order to be equipped for the practical duties of life the pupil must get his knowledge of geography at the present time, if he ever gets it, in the secondary school. The pupil who expects to enter college will continue in college to accumulate knowledge, increase his ability to discuss, compare and arrange the results of his observations and broaden his study of relations as well as of facts and phenomena, and gain skill in drawing conclusions from his facts and their relations. The best possible preparation for that is to bring with him from the high school the habit of observation and comparison. I know of no better way to get this habit than by the study and comparison of things. This has the advantage of giving him knowledge and equipping him for the acquisition of further knowledge and finally, by means of his training, he will use his knowledge for the development of his own principles or for the intelligent understanding of those developed by others. Without the knowledge he might gain a second-hand and imperfect understanding of the principles but it could never become a complete, sympathetic appreciation.

I find it necessary, very often, to remind teachers that physical geography is geography and not psysics. A considerable percentage of the

laboratory manuals that have been put on the market for pupils in secondary school, physical geography are mainly manuals of physics. Geography is a science of observation. Physics is a science of experiment. This is especially true of the elementary phases of these sciences. The high school pupil, while studying physical geography, in practically all cases does not understand the principles of physics on which an explanation of the fact or phenomena that he observes is based, yet that does not hinder him from getting, by observation alone, a clear-cut, distinct conception of it. If the teacher has to stop to explain the physics concerned in the fact he will not do anything in geography. It is moreover no more necessary for the secondary school pupil to understand the physics involved in his physical geography than it is for him to understand the chemistry of his crayfish or frog in his elementary zoölogy. In none of the observational sciences, can we go back to fundamental principles in elementary work. Nor is it desirable. Before the principles can be applied in Physical Geography there must be a knowledge of the facts and phenomena to which they are to be applied. Secondary school physical geography must lay the foundation of fact and wait until a later period when the pupil has been equipped with both fact and principle before the application is discussed. The text-books and laboratory manuals should keep this as their central fundamental idea.

To say that the popular text-books place too much emphasis on *explanation* of phenomena, does not mean that explanation should be rigidly excluded. There is danger, however, to the development of the young pupil's mind by injudicious attempts at explanation. The student is liable to get the idea that scientific explanations are fixed, rigidly correct and that the limit has been reached in the investigation of the subject explained. He ceases to interest himself in the matter. The subject becomes a hard, inelastic, cold, cut-and-dried affair, not a living, changing, progressing relation between the world without and the world within.

Another danger is that of causing the student to think that science is a matter of theory with only incidental relation to fact; that the theory is more important than the fact and that the latter is valuable only as a filler of a *pigeon hole* in an elaborate theoretical system rather than a foundation on which the whole superstructure of scientific theory is to be based. I am not here forgetting the hypothesis or the multiple hpyotheses of the investigator, but I do not believe these matters can be handled with safety until the pupil has accumulated a considerable store of fact and until he has reached a higher degree of mental maturity than that attained by the average secondary school pupil.

XUM

II

The pupil enters the secondary school from the grades with very imperfect knowledge of geography even as it is presented in the grade school. He knows nothing of the great variety of land forms. So far as any definite ideas are concerned he scarcely knows that there are a great many forms differing widely from each other. The average student could not describe the significant features probably of any land form. He is still less able to understand the relations of different forms because he has not studied and compared them. Until they have been studied, compared and described he can not understand the discussion of their systematic classification. Such a discussion calls up no definite form, idea or picture to his mind. Classifications and their discussion are unintelligible until some knowledge of the things classified has been acquired. It is impossible to classify land forms until a knowledge of at least a considerable number of such forms has been acquired by the one who is making the classification. Before a student can get any information or training out of a classification of land forms he must know them, but the high school student does not know them. He did not get an opportunity to study them in the grade school and since he was not born with the knowledge he can not have it.

The secondary school course in Physical Geography should concern itself with the acquisition of geographic knowledge, the methods of getting it and the discussion and comparison of the facts and phenomena. The pupil needs the knowledge of the facts as a basis for his later studies; he needs a training in methods to enable him to continue to increase his store of fact and, finally, he needs some training in discussion and comparison of facts, preliminary to more advanced work which should partake of that character to a progressively increasing degree. The knowledge, however, is the foundation on which everything else must be based.

This is the method in other sciences. The zoölogist studies his crayfish, or whatever form he takes up, from the point of view of fact alone. Its relation to other forms is not considered until at least one other form has been carefully studied.

Classification becomes useful and necessary only as a means of handling a great number of facts or objects. It is necessary and useful only after prolonged study of many forms. In modern high school zoölogy, classification is not attempted. Even in botany where systematic study and classification of forms is pursued to a greater extent than in zoölogy classification is subordinate to a study of the facts. Twenty-five years ago animal forms were described as members of certain groups or classes much

as land forms are described to-day in the popular text-books of physical geography. Modern zoölogy abandoned that method several years ago. Physical geography must do so or fail to maintain its position as one of the sciences in secondary school courses.

III

I do not think it should. The pupils who do not expect to enter college will get most benefit from the course if it takes up the subject from the point of view outlined above. This is one point that most text-books seem to have forgotten, that is that physical geography is geography and not physics. Being geography, the objects of study must be thought of, presented and studied from the geography standpoint. The subject does not or should not differ too greatly from the geography of the grades; it concerns a different set of phenomena or the same phenomena from different points of view and more thoroughly, but these phenomena should be considered on the basis of the geographic relations, not solely as members of a cut-and-dried class. It is in this way that these phenomena become important factors in human life.

As mere phenomena aside from their geographic relation they are physics, as phenomena of the earth they are geographic phenomena and therefore of great importance to high school pupils who do not expect to enter college.

Their study as geographic phenomena, however, does not lessen their educational value. They are as important for training the intellect when studied as geographic facts as when studied as physical principles.

IV

It would not only be equally valuable, it would be more valuable for such students and would be more valuable also for pupils who propose to enter college. The study of the subject on the regional basis would make it a study in geography. A knowledge of well-selected regions, a detailed knowledge such as can be obtained from good, large-scale topographic maps, would be of practical value to the business man, professional man, engineer, or anyone else engaged in the main avocation of man.

Such knowledge would be valuable also to the pupil who proposes to enter college by giving him a basis of fact for use in his college course in developing the great principles of earth evolution. To pursue the subject in college he must bring this basis of fact with him or else acquire it after he enters college. If he enters college with it he is that much ahead of the man who enters without it. The educational training to be obtained

XUM

by evolving principles from known facts is much greater than that derived from the ability to pigeon-hole a fact in a deductive scheme. The deductive scheme is not the student's scheme. It must be given him by the teacher. The handling of the facts in such cases becomes a kind of clerkship handling. It is like the mechanical keeping of records in a great administrative office by a clerk according to a system worked out by some one else. It is wholly unlike the working out of the system on the basis of an intimate knowledge of the records to be kept.

V

This is partly answered in the preceding. The student of history, economics, sociology, etc., needs a knowledge of geography, not a theory of earth development. It is true that if he has both they will be supplementary. One will help to retain and appreciate the other but the theory is intelligible only when it is supported by a knowledge of the facts on which it is based; by a knowledge of the actual physical geography of the earth or some part of it. The latter is the main consideration for prospective historians, economists, etc.

A course along the lines suggested in No. 4, would be more disciplinary and stronger than that given by most teachers on the basis of the popular text-books in the subject. It would follow the logical method, it would follow the order of development of the human mind, it would follow the order in which other and similar natural history sciences are taught. The discussion of scientific theories such as the theories of earth development, and the discussion of schemes of classification of the phenomena of any science is the end sought or one of the ends sought, and should follow rather than precede the acquisition of an intimate knowledge of the facts dealt with in the subject.

VII

I do not think so. An intimate knowledge of the physical geography of the earth can not be gained from merely reading descriptions or looking at lantern slides. It must be got from a study of the earth itself or, where that is impossible, as it usually is, by the study of the best images or reproductions of the earth, or parts of it, that can possibly be obtained. These are maps of various sorts; models, charts, photographs and statistical and descriptive data. These must be studied. They must be used as the means of answering questions concerning the earth. They must be studied as the pupil in zoölogy studies his crayfish, or grasshopper. Their use as *illustrations* has some small value, but an intimate knowledge can not be obtained in such a way. They must be studied in a laboratory.

VIII

No important work in the study of life responses can be done in the secondary school. That is a phase of the subject that comes only after wide knowledge of earth conditions has been obtained and greater constructive ability has been attained than is possessed by the average high school pupil. He will be engaged not only in the high school but also in the first year of his college course in acquiring a knowledge of the things that respond. The response is unintelligible until he has that knowledge. I do not mean to say that all reference by the teacher to such response should be rigidly excluded. I do not think it should be, but no discussion of such matters would be profitable. Geographic response is one of the end products of geographic study.

If there can be very little done in the matter of geographic response in the high school, then where is the pupil who does not go to college to get that knowledge? He will get it in the school of life if a proper foundation has been laid in the secondary school. The school of life takes the place for him occupied by the college for the other pupil. They must both have the same fundamental training. In the school of life progress is slower but there is progress nevertheless.

M

1. No.
2. Yes, to a certain extent. I think it is generally overdone, however.
3. No.
4. Yes, I am decidedly in favor of the less general treatment.
5. Yes, most decidedly.
6. Yes. The latter.
7. No, not with sufficient equipment and proper direction.
8. The latter appeals to me not only as an important but as an essential element.

N

1. No.
2. Yes, if it is not carried too far.
3. Yes.
4. I believe that secondary school geography taught according to the method outlined under "b" would be more valuable than the usual course in geography to pupils not preparing for college.
5. Such a course would be a better preparation for students of history and economics. It would give greater opportunity for practical work and would thus increase the pupil's knowledge of the world around him and make him a more valuable member of society.

XUM

6. I believe that commercial geography should be taught in every high school. I think it can be taught satisfactorily in connection with regional geography and it may be treated as an adjunct.
7. I think that as much laboratory work ought to be given as can be given without interfering with the structural backbone of the work. A great deal of work has a tendency to be invertebrate.
8. I do not.

O

I find to-day that your letter of February 15th is still unanswered and I hasten to reply to it, although under the circumstances my reply must be very brief. I will give categorical answers, arranged in the same order as your questions.

1. If you mean secondary students below those of college grade, I would say No, emphatically. If you mean pupils in the high school, I would say No, provisionally. Given a properly equipped teacher and a good text-book in commercial geography, the modern physical geography would be discarded.
2. Yes, as a science; No, if you mean the teaching of this stuff in secondary schools. We are going to witness a strong revulsion against this idea in the next few years.
3. Unprepared to say.
4. If a course in secondary school geography included more of a study of selected regions of the world, it would be more valuable as "a;" intensive study of single regions for university work; regional geography. If attempted in the geography of secondary schools, should treat all the continents.
5. Approval of 4 in contrast to 2 is a reply to 5. I would say that such a course will in time be regarded as the only proper basis for the study of history and economics, and as a preparation for reading in the case of those students who do not enter college.
6. Yes, if it is commercial geography of the sort which reduces statistics to a minimum and principles to a maximum. I believe that commercial geography should be the preferred form of geography in the high schools. This, to furnish such a basis of principles as will enable the student to follow intelligently the events of his day. The intensive study of continents to be a feature of college and university work.
7. Here is a question which leads right to the heart of most difficulties connected with secondary school geography. It is a current notion

that work is not scientific unless done in a laboratory, and many secondary school exercises are drawn out so as to cover a laboratory period, instead of a geographic principle. Many aspects of physical geography require laboratory work, but on the human side we must get away from the notion that a separate period for laboratory work is absolutely essential and I believe that even on the physical side it can profitably be very much reduced.

8. Read 1st line 1st word. Do you not mean "physical" instead of "formal?" If so, I would agree to the statement that more emphasis should be put upon the life responses. We must acquire the notion that the students' skill and penetration may be as thoroughly tested by the study of life responses as by the study of the development of land forms.

P

A BRIEF CONFESSION OF A GEOGRAPHIC FAITH

(Being a Reply to a Shorter Catechism)

I BELIEVE that geography is a study of the earth in its relation to life—plant, animal, and human; that neither the study of the earth unrelated to life nor the study of life without emphasis being placed on its relations to the earth is geography.

I believe that there is only one geography; that mathematical geography, physical geography, biological geography, anthropogeography, political geography, and commercial geography are but different departments of a definite body of knowledge that should be viewed and treated as a unit, as a science. I believe that no department of geography can be taught *as geography* without teaching its relations to geography *as a whole*.

I believe that most of the subjects of study pursued in secondary schools are, because of their very nature, related to geography; that they reach their greatest value as subjects of study when they aid or interpret human development; and I believe that human development is greatly determined by geographic influences.

I believe that a liberal knowledge of geography is essential to the reader of current events, to the student of history, political economy, and finance, hence essential to the patriotic citizen. That geography should be an "elective" in secondary schools is not consistent with my expressed geographic faith.

I believe that a systematic classification of land forms and of water

forms is an essential to geography as the systematic classification of plants to botany, of animals to zoölogy, and as the systematic classification of the materials of any science to that science.

I believe that the value of any classification depends upon the *basis* of classification; that the classification of land forms reaches its highest value when based on (1) origin, and (2) development; because these determine conditions, either favorable or unfavorable, for human activities.

I believe that the geography course for pupils not expecting to enter college should not be in any way different from that for pupils preparing for college entrance; that any department of geography overworked, or worked to the neglect of other departments, becomes distorted, and the unity of geography becomes unbalanced; but that a pupil may specialize in any given department *after* he has given due attention to each department in its relation to geography *as a whole,* thus permitting him to view that department in its true perspective.

I believe that geography is a study of the earth (not of selected regions) in its (not their) relations to life; that the needs of civilized man make requisitions of all regions of the world, and that all regions of the world are bound together by electric bonds; the orient has become the occident; the "Far East" is our next-door neighbor. I believe that limiting the study of geography to selected regions would lessen its value as a preparation for history, economics, and also for the understanding of current events.

I believe that commercial geography should be emphasized during the latter part of the high school course, whether that course is technical or non-technical, but that due emphasis can not be given it when it is studied simply "as an important phase of some systematic *regional* treatment." I believe in the culture value of geography as well as in its utilitarian value, and that every pupil is entitled to the benefits of each.

I believe that the value of so-called laboratory treatment of geography is overestimated; that much of the so-called laboratory treatment is strained; and that in many of the experiments geography becomes a means and the experiments the end. I believe that the mapping of cyclonic winds and ocean currents is highly essential, and that the mapping of the home state in the grades is highly essential, and that the latter is as truly laboratory work as the former. I believe the field is the geographic laboratory and blessed are they who labor in it. I believe that nothing of value "would be sacrificed" if the presentation of geography "were a little less formal, and included more of an emphasis of the life-response side."

Q

1. No.
2. No.
3. No.

4b. Such a course would be more valuable than the present type of physical geography.

5. Equally disciplinary in the best sense and more useful.
6. Not a separate course; a phase of *geography*.
7. Yes, beyond a doubt.
8. No. I have yet to see any results of laboratory work in physical geography which even the instructor considered highly satisfactory. I do not include field work; that is all right.

R

It is with much pleasure that I contribute my part to the very interesting inquiry you are making into the development of geography in the secondary schools. I answer the questions by number and in order.

1. Geography in the secondary schools offers the only systematic training in earth-science that students who do not go to college ever get. I think it should be broad enough to include every phase of treatment of the earth in its relation to life.

   There is a vast fund of useful information that every intelligent, appreciative citizen should have, and that every graduate of a high school is expected to have, that can be gotten in no other part of our secondary school curricula. This information is not only useful, but if given in the proper way is just as educative as any other work of the schools. It trains the observational, imaginative, and reasoning faculties in a field that is otherwise untouched.

   Our average modern text-book of physical geography does not cover the ground, and if it is objected that the matter here suggested has no proper place in physical geography, then I would say call it by some more comprehensive name, as earth-science.

2. Personally I have long since ceased to place the stress upon detailed classification of land forms that is given it by most of our texts. Inasmuch as land forms are not capable of exact definition, and as they are all essentially the results of the same processes, only acting under varying conditions, it would seem that only so much of arbitrary classification should be given as will aid the fixing in the mind of the pupil some important principle or fact. Much greater importance should be attached to natural classifications than may be found possible.

XUM

3. My notion is that our work in physical geography should be planned with reference to the needs of the pupils in after life rather than to the possibility of their going to college; but I also think that such a course as best fits for intelligent citizenship should be accepted as a college entrance requirement, since what is most desired by the college is *ability* to do, and not acquirement.
4. I must confess a partiality for the study of physical geography in the high school from the standpoint of evolution. Not only the earth as a whole, but all its features are best understood when studied in their evolutionary development. I would not carry the regional study of geography, so well suited for the grades, to any considerable extent into the high school.

   The field of observation of most students is so very limited that any method followed must depend chiefly upon a study of printed reports of what other observers have accomplished. I have obtained better results when with the class I have traced deductively, from an assumed beginning, the consequences of causes known to be acting. The varying conditions under which these causes act must, of course, be considered, and for the most part suggested by the teacher.

   After such deductive study the pupils are better able to appreciate and interpret consequences wherever found; and the entire earth should be drawn upon for illustration.
5. I consider a course planned upon the lines above suggested of the highest disciplinary value; for I am not at all in sympathy with the notion that to be of disciplinary worth a subject must be alike difficult and distasteful. It has the further merit of preparing the pupil for a fuller appreciation of both history and economics, whether he does or does not take a college course.
6. The only part of so-called commercial geography, the non-statistical part, that the non-technical student needs is included in the course supposed.
7. Physical geography has too recently become a laboratory subject to judge fairly of results. Only after we get well-thought-out laboratory exercises, and well-planned laboratory guides, and when teachers have been *trained* for such work, may we fairly judge.

   For students in city high schools the laboratory work seems of necessity chiefly an examination and interpretation of maps and charts, unless provision is made for a wet laboratory; and the average student is apt to become tired of too much work with

maps. In village schools better facilities are afforded for out-of-door work, and this sort of laboratory work is best as it is most interesting.

In either case, in city or village school, I would have the laboratory work follow the class-room work, and as far as possible be illustrative and confirmatory of it.

It has not impressed me that our texts have been too much influenced by the demand for laboratory treatment.

8. Not only do I *not* think the good results from laboratory training would be sacrificed or even endangered by a less formal presentation of the subject, but on the contrary I think they would be increased just to the extent that well-planned exercises dealing with life-response are given.

Here again, it seems to me, the village school has the advantage in the better opportunity afforded for work out of doors where studies in life-response may best be made.

S

1. No.
2. No.
3. No.
4. Yes.

4a & b. Yes—"a" first.

5. Yes.
6. Preferably the latter.
7. Yes.
8. No. More emphasis on life-response side.

THE BARABOO REGION OF WISCONSIN*

By G. R. MANSFIELD
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THE Baraboo Ridges (Fig. 1) are well known topographic features in south central Wisconsin, thirty miles northwest of Madison. Attractive woods, rocky hills and remarkable gorges, one of which is occupied in part by the picturesque Devil's Lake, have long made the place a favorite summer resort for people living in that part of the state, and even for travelers from more distant places. The Saint Paul Division of the Chicago and North-Western Railway passes through the heart of the district. Trains stop at Devil's Lake, at Baraboo, and at Ablemans, near the north ridge, thus making the region easily accessible. In the summer of 1907 a small grant from the Sturgis-Hooper fund of Harvard University enabled the writer to make a brief inspection of a part of the area.

The geology and geography of the Baraboo region have become more or less familiar through the labors of members of the United States Geological Survey and of the Wisconsin Survey,† and, for some years past, excursions have been made to this locality by classes from neighboring universities.

The country, exclusive of the Baraboo Ridges, averages about 1,000 feet in elevation. Two types of topography are presented. To the west and southwest dissection has reached a late mature stage. Drainage is uninterrupted. The larger streams have developed broad flood plains, so wide that the rivers, in their meanderings, touch the valley sides only occasionally. Even the smaller streams have developed flood plains of some width, and in places the intervening uplands have been cut away, leaving extensive areas of relatively low land, with here and there residual masses of unconsumed upland. The surfaces of the uplands themselves have fairly accordant levels, which rise to within 400 or 500 feet of the crests of the South Range, and indicate an earlier peneplaned surface, below which the later dissection has produced a relief of about 300 feet.

To the east and southeast there is little dissection. Depressions with no outlets, swamps and ponds abound and streams are generally sluggish. There are many lesser elevations, usually in the form of rounded hills, but these have no definite relation to the streams. The latter wander aimlessly about in swamps, and have as yet accomplished little in the way

*The writer is indebted to Prof. W. M. Davis for helpful suggestions.

†See especially Salisbury, R. D. and Atwood, W. W. "The Geography of the Region about Devil's Lake and the Dalles of the Wisconsin." Wis. Geol. and Nat. Hist. Surv. Bull. V, Educ. Ser. 1, 1900.

of making valleys for themselves and draining the surrounding country. Locally some of the streams have cut valleys for short distances. A particularly striking case is furnished by the Wisconsin River, near Kilbourn, where it has cut the beautiful gorge known as the Dells, or Dalles, as it is sometimes called, fifty to one hundred feet deep, in relatively weak

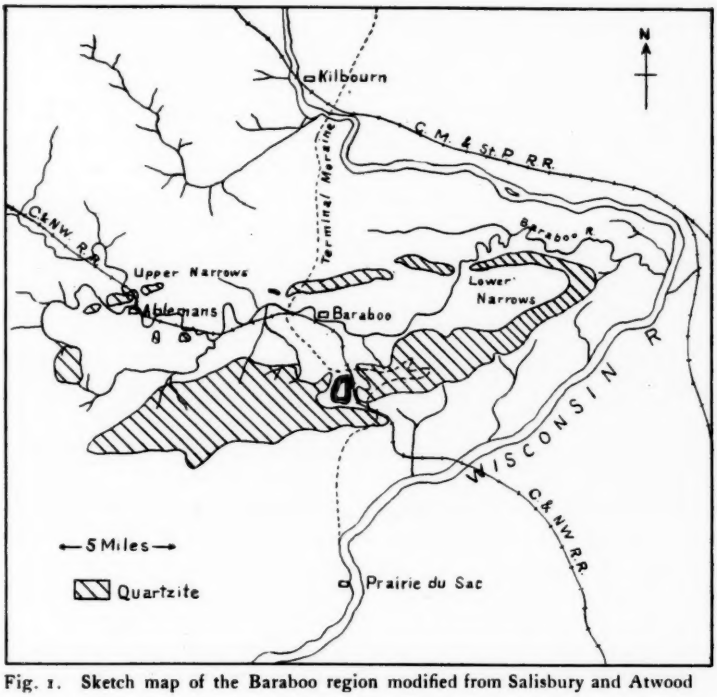

Fig. 1. Sketch map of the Baraboo region modified from Salisbury and Atwood

horizontal sandstones. From this region the Wisconsin makes a wide detour southeastward, around the east end of the Baraboo Ridges, and then returns to a point six or eight miles south of Devil's Lake, where it again bends southward.

The Baraboo Ridges run nearly east and west for about thirty miles, and rise somewhat abruptly from the surrounding lower country. They are heavily wooded and form a marked contrast to the relatively open fields and farm lands north and south. They are divided into two ranges, of which the northern is lower, narrower and less continuous. The South

Range reaches a maximum elevation of 1,600 feet just east of Devil's Lake and falls off gradually toward both the west and the east. The ranges are joined at the eastern end. Both ridges are cut by transverse gorges or passes of wild and picturesque beauty. The Baraboo River occupies the two main openings of the North Range. These are known respectively as the Upper and Lower Narrows, but the latter is too wide to be proportional to the present breadth of the stream. The gorge in the South Range is the largest of the group and is not now occupied by a river. Heavy bands of moraine pass across the northern and southern ends and within the enclosure thus formed lies Devil's Lake with rocky cliffs and crags rising steeply on either hand. A view of this part of the range from the north, together with some of the morainic topography, is shown in Fig. 2.

The ridges owe their present relief to the fact that they are composed of ancient quartzite rocks, very resistant to erosion. These rocks were originally horizontal but are now tilted at varying angles and bear other evidences of considerable deformation. Here and there, on the ridges, occur patches of undeformed, weaker conglomerates and sandstones, like those that underlie the lowlands round about. Similar patches occur in several of the passes, including the Devil's Lake gorge, and in some of the older valleys that do not cut through the ranges. These residual masses, together with the larger body of sedimentary rocks underlying the neighboring region and abutting against the quartzites, show that the ridges, with their included passes and older valleys and all the surrounding country were once covered with sedimentary deposits to a considerable depth—buried, as it were—and that by subsequent erosion they have been exhumed and again laid bare. But the presence of passes in the quartzite ridges before the deposition of the later sediments suggests a long history that bears upon our interpretation of the present physiographic features.

It is not known how deeply these passes were excavated before burial. If they were already developed as transverse valleys, they may represent ancient river courses that became superposed upon the hard quartzites during revival after peneplanation in a previous cycle; for, during the peneplain stage, rivers may meander so widely as to carry their channels over more resistant rocks than those in which they were originally developed. Under such circumstances revival may cause a stream either to be superposed or to change its course. Such an explanation then involves two cycles of erosion; one in which the peneplain was produced and a later one, inaugurated by revival, in which occurred the superposition of the stream and the development of the transverse valley. Another explanation, involving but one cycle of erosion, would account for the development of

transverse valleys by the gradual lowering and shifting of the divides between the heads of opposing streams until at first notches or passes in the ridges were formed and finally the transverse valleys appeared.

The character of the surface, on which the later sandstones were deposited, indicates that an advanced stage of erosion had been attained, for

Fig. 2. Devil's Lake gorge from the north, showing morainic topography

the old distorted rocks of the region, with the exception of the very resistant quartzites, were bevelled and even the latter were reduced to subdued outlines. Thus one stage of peneplaination and possibly two such stages, as suggested above, preceded the deposition of the sandstones. But the latter belong to the Cambrian period so that all this ancient erosion occurred in Precambrian times. During the ensuing long period of sedimentation the ridges and their surroundings became deeply buried. Finally revival again took place and the thick covering was largely removed. This period of erosion has continued until the present day, but the rate has not been uniform. Two well-defined cycles or partial cycles have been recognized and there is some evidence that there may have been still others. This erosion has cleared out the sedimentary fillings of the gorges and may even have deepened the latter and modified the ridges, but it is probable that, in so far as the ridges are concerned, the ancient surface is preserved to us

much as it was at the time of burial and may thus be considered as a fossil landscape of Precambrian times.

In the glacial period the ice covered the eastern part of the ranges and the country north and south of that portion, but it did not reach the western region. This, then, is the reason for the two types of topography previously mentioned. The western and southwestern districts, that so well exhibit the erosion type, are a part of the driftless area into which the ice did not extend, while in the eastern and southwestern area the topography, originally like that farther west, has been masked and modified by glacial drift. The line of separation between the two types is well marked and runs nearly due south from Kilbourn to Prairie du Sac. Where it crosses the ridges it bends eastward, and where it reaches the lowlands it turns westward again, thus showing the retarding influence of the resistant ridge upon the westward-moving ice near its margin. The terminal moraine passes four or five miles west of the city of Baraboo, and the rolling, undulating topography which it produces is well shown near that place. Devil's Lake is the diminished descendant of a marginal lake that occupied an interlobate position in the lee of the eastern part of the South Range (Figs. 1 and 2).

One of the interesting questions raised by the relation of Devil's Lake to the enclosing gorge is what part, if any, the Wisconsin River may have taken in the Preglacial history of the ridges. The eastward deflection of the Wisconsin south of Kilbourn has already been referred to. The Lower Narrows of the Baraboo River are much wider than the Upper Narrows and appear to have been occupied by a more powerful stream than the Baraboo. The Lower Narrows, too, are comparable in size to the gorge in the South Range. Positive evidence is lacking, but it is believed, in accordance with Irving's suggestion, that the Wisconsin formerly flowed through both the Lower Narrows and the Devil's Lake gorge. Then the Baraboo River probably joined the Wisconsin at some point between the two ridges, after passing through the Upper Narrows. The present course of the Wisconsin has, then, been produced by glacial obstruction in the region between Kilbourn and Prairie du Sac. Devil's Lake has been formed by the enclosure, between moraines, of part of the old valley floor.

In the driftless area during Glacial and Postglacial times erosion progressed in normal fashion, the streams degrading or aggrading their valleys as the ratio between carrying power and load increased or diminished. In the glaciated area, on the other hand, Preglacial activities ceased when ice covered the land. Hills and valleys alike were scoured by ice action, and a coating of till, varying in thickness, was spread widely over the

surface, with the general effect of planing off the hills and filling up the valleys. When the ice retired a new surface was exposed, from which most of the earlier drainage lines had been obliterated. In place of the nicely adjusted system of branching and sub-branching valleys, so well seen in the driftless area, the surface of the glaciated area presented a series of broad flat depressions, with many minor hollows and elevations, having no definite relation to each other. Waters gathered in all the depressions, and the streams, partly or wholly displaced from their former channels, were forced to wander from one filled hollow to another over the lowest places in the divides. Since the Glacial Period the streams, usually of slight grade, have been able to do little cutting. Many of the ponds thus formed have been filled or partly filled by the combined action of stream wash and the rapid growth of water-loving plants, but there are still numerous ponds and extensive marshes that have yet to be drained or filled. The Wisconsin River is a notable exception to the general rule, in that it has made deep incisions in the till and cut the beautiful gorge of the Dells.

In the ridges themselves, several streams, having the advantage of steeper grades, have been able to carve for themselves in Postglacial times deep and picturesque ravines. But these are all in their youthful stage, as is shown by their steep-sided, V-shaped valleys, rapid currents and rocky bottoms.

To the systematic physiographer the Baraboo region offers an attractive field, for there, within comparatively small compass, is included a considerable variety of forms well worthy of classification. In the first place there is the ridge itself, a bit of fossil landscape preserved from remote geological times. One of the more recent geographical terms that has received general adoption is the term *monadnock,* a name applied to those hills, which, like Mt. Monadnock, New Hampshire, represent residual elevations of resistant rock in a region eroded nearly to baselevel, that is, in a peneplain. It has been suggested that the name *baraboo* might be applied to those elevations, which, like the Baraboo Ridges, represent ancient monadnocks that have been entirely buried by later sediments and then exhumed.

Superposed rivers have for some time been recognized as in some cases the result of revival in a peneplained region, where rivers, in their broad meanderings, have wandered over harder rocks than those in which their courses were originally developed. It has been seen that the Precambrian passes of the Baraboo Ridges may be examples of ancient superposed river valleys, or of passes developed by opposing streams in a single cycle, subsequently buried and then re-excavated. Some shorter terms for buried and re-excavated, superposed valleys or one-cycle passes would be highly desirable but none have as yet been advanced.

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The driftless area has already been described as a region in a late mature stage of development, succeeding peneplaination in an earlier cycle. Its presence in this region and the recognition of its character are valuable aids in the interpretation of the physiography of the neighboring glaciated area. The occupation of the country by ice may be regarded as accidental, in so far as the previous development of surface features was concerned. From the evidence afforded by the driftless area we know that the country now glaciated must have reached a similar stage of development and must have had a well organized system of drainage, adjusted to the given conditions of volume, load and slope. When the ice overwhelmed this territory and finally withdrew, its action had completely disorganized the previously existing, adjusted conditions and had necessitated an entire readjustment of the streams to their work, just as in volcanic regions it sometimes happens that showers of dust and streams of lava greatly modify the surface of the country and force the rivers to readjust themselves. The physiography of the glaciated area is not properly understood if the latter is regarded as merely in a youthful stage of development. The idea of readjustment must also be considered, since the process of development has been different from that in a youthful region not glaciated. In the Baraboo region these fine examples of adjusted drainage in a late mature stage and readjusted drainage in the stage of youth are exhibited side by side in striking contrast, the line of division between the two types being clearly outlined.

One of the features common in areas where readjustment of drainage is in progress is the cutting of new channels by rivers that have been partly or wholly displaced from their former courses. The Wisconsin River is a fine example of such a stream. From a few miles above Kilbourn on the north to the region of Prairie du Sac on the south, the Wisconsin flows in a postglacial channel, and in two places it has done noteworthy cutting, as stated in earlier paragraphs, but the narrow and steep-sided nature of the valley where the cutting has occurred and the extensive marshy areas along the course of the river bear witness to its youthful condition. In Skillet Creek, three miles southwest of Baraboo, there is displayed another youthful feature of the same process. In a well-adjusted drainage area falls and rapids have been obliterated and the channels of the streams have been reduced to grade. When, however, a river is for any reason displaced from its valley, it is forced to cut a new channel, and falls or rapids reappear whenever rocks of unequal hardness are crossed. At Skillet Falls the creek forms a series of fine cascades, where it cuts through layers of unequal hardness in Potsdam sandstone.

NEWS ITEMS

Professor W. J. Sutherland of the Western Illinois State Normal School, Macomb, Ill., has recently published an unambitious and helpful pamphlet entitled Practical Suggestions for Teachers of Geography. Though primarily for teachers in Illinois, the portion devoted to the study of weather and of maps is helpful to all. The Course of Study of the same school presents a detailed outline in geography which is more than helpful.

Professor Albrecht Penck of the University of Berlin will be Silliman Lecturer at Yale University during the Academic year 1908-9. Professor Penck has also been appointed Kaiser Wilhelm Professor at Columbia University during 1908-9. He will be in residence during the first half year.

The Ninth International Congress of Geography will be in session in Geneva from July 27 to August 6, 1908. According to the preliminary program, Professor W. M. Davis of Harvard University will be President of the Section on Educational Geography. Miss Zonia Baber of the University of Chicago will present a paper before this Section on the Pedagogics of Geography. Professor A. P. Brigham of Colgate University will speak before the Section on Economic Geography on the Distribution of Population in the United States. Membership may be secured by remitting five dollars, together with full name, address and title or position, to M. Paul Bonna, Tréasorier du Comité d'Organisation, 3 Boulevard du Théâtre, Geneva, Switzerland.

Professor W. M. Davis of Harvard University announces that he will spend the larger part of July in geographical field work in Northern Italy and the Alps. He will welcome as associates advanced students, practised in field work, who seem qualified to take up systematic work in a more or less independent way. The problems suggested include the study of glaciated and non-glaciated valleys, coast features, river features, etc. Prospective candidates should address Professor Davis, care of Sebasti e Reali, Rome, stating qualifications and including a letter of introduction from the professor of geography with whom they have recently studied.

Professor D. W. Johnson of Harvard University will spend portions of July and August in physiographic studies in the volcanic region of Auvergne, France, and will be glad to have advanced field students associated with him. The party will assemble at Clermont, France, about July 6. Professor Johnson may be addressed at 56 Wendell Street, Cambridge, Mass.

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NOTES

COMMERCIAL ROUTES OF SOUTH AMERICA.—A consideration of the trade routes of South America as supplied by inland waterways in connection with railway lines is published in the issue for February 8, 1908, of *Dun's Review*, and is a valuable exposition of this important subject.

Eliminating from examination the smaller routes traversed by internal commerce, Prof. J. Russell Smith proceeds to a discussion of the three great navigable rivers which give entrance to the interior of South America from the outside world—the Orinoco, the Amazon, and the La Plata. The valleys drained by these rivers are equalled in extent and fertility in the temperate zone by the Mississippi, the Yangtse Kiang, and the Danube only. Through many short feeders, South American commerce gravitates by these main routes to the ocean, where numerous ports are required as a final outlet for interior products.

In the north, the Magdalena River resembles in its service a trunk-line railway, the river itself being the trunk, and in addition to its navigable branches it numbers several short lines of railway among its feeders. The river mouth is choked with sand, but the two ports of Cartagena and Savanilla are connected by short railways with their river ports, of which Barranquilla, on the Cartagena Railway, is the most important. The river steamers are of a type used on the Mississippi. The total length of navigation on the river is 900 miles and on the branches 215 miles. Rapids at La Dorada, 592 miles from Barranquilla, make it necessary to use a railway for 14 miles, after which boats are again used. The lower valley is a green, almost deserted waste. The chief centers of Colombian population, agricultural and mining, are on the interior plateaus drained by the Magdalena, from which short lines of railway and numerous pack trails make connection with the river steamers.

The river Atrato, draining a deep valley to the west of the Magdalena, is navigated almost to its source, and the commerce of the valley is served by one or two steamers setting out from Cartagena.

The center of the Venezuelan population is on the cool plateau around Caracas, where there are some highways and several short railways united into a system reaching the seacoast at the ports of La Guaira and Puerto Cabello. The territory served by these ports is of comparatively small area, and is limited to the highlands east of Lake Maracaibo and north of the Orinoco Valley, but it is the most valuable section commercially. The longest trade route of Venezuela is that furnished by the navigable Orinoco, although the commerce is light. Steamers can run up the river

for 1,000 miles, and occasionally small ocean-going vessels ascend to Bolivar, but European and American goods are usually transferred to local vessels at Port of Spain, Trinidad.

From the Orinoco to Bahia, 13 degrees south, there is a succession of ports, each the outlet for small coast settlements. Along the whole length of this coast, approximately 2,000 miles, there is but one route to the interior—the Amazon. This river and its branches afford a magnificent system of inland waterways running through a region that is entirely covered with forest. The principal industry is rubber gathering, although some Brazil nuts and cocoa are shipped. The increase in the price and applications of rubber has brought prosperity to the Amazon Valley; its three ports—Para at the mouth, Manaos, 1,000 miles upstream, and Iquitos in eastern Peru—are busy trade centers. There has been an increase in the steamer service, which now traverses several of the more important branches of the great river. There are many streams of the Amazon system that could be made navigable by the use of so-called snag boats such as are constantly employed in pulling obstructions out of the Mississippi River.

Some authorities place the possible navigation of the Amazon Valley at 15,000 miles, but the part at present navigated is far below that. Steamers regularly arriving from Europe go as far up as Manaos, and the Amazon will receive the commerce of a considerable region in eastern Bolivia upon the completion of 200 miles of railway now building to connect the navigable lower Madeira with its Bolivian branches above the eighteen cataracts. It is estimated that there are 3,000 miles of navigable rivers in the Bolivian plain that at present are almost useless because of the separation from the Pacific by the Andean wall, from the Atlantic by the Madeira falls.

Next in length among the trade routes of Brazil is that from Bahia to the upper course of the San Francisco River. Bahia is the center of an important coast district and the terminus of a railway 300 miles long connecting with the steamers on the San Francisco above the falls that break its lower course as it descends from the plateau. This inland waterway is navigable for about 700 miles, but the population and commerce of the valley are inconsiderable, the greater part of the commerce of Bahia having its origin in the coast districts.

Rio de Janeiro and Santos are the chief ports of Brazil, and the ocean termini of the trade routes over which passes Brazil's leading export, coffee. The coffee district occupies a broad plateau and has a railway system which has developed into something of a network, with outlets at the two ports.

These roads also carry the Brazilian manganese ore, and the traffic on the Santos line has recently made it necessary to double track the road from the port to the inland metropolis, Sao Paulo, which is a city European in population as well as in appearance. The extremities of this Brazilian railway net reach, by devious routes, points as far from the terminal ports as Cleveland and Columbus, Ohio, are from Philadelphia and Baltimore.

The River Plate or La Plata Valley is the next trade route of importance on the east coast. Here, one of the great rivers of the world under the names La Plata and Paraguay offers an open route far into the interior. Ocean steamers ascend in large numbers to Rosario, 230 miles above Buenos Aires. Commodious river steamers ply regularly from Buenos Aires to the ports of Paraguay. From Asuncion small steamers wind through the swampy forests to Cuyaba, 680 miles to the northward. By this circuitous route the Brazilian governors go out to their post at Cuyaba, the capital of the remote and sparsely peopled State of Matto Grosso, which is larger than Great Britain and France. Diamond mines and cattle ranches are the sources of the commerce of this district, so that traffic on the upper Paraguay is correspondingly light. From Paraguay to the ports of the Argentine Republic and Uruguay there is a lively traffic in truck and subtropical produce sent to the colder lands downstream.

The fertile plain of the Argentine Republic to the west of the lower Parana and La Plata is low, healthful, of easy access to the sea, rich in sheep, cattle, wheat, and maize, and is served by an excellent network of railways. The foci of these lines are the ports of Buenos Aires and Rosario. To the west of longitude 64° west, the rainfall is sufficient for agriculture and the network of railways gives place to four single lines going directly across the plains to the irrigated districts at the foot of the Andes. Two of these roads lead to the northwestern province of Tucuman, the sugar producer, 900 miles from the Atlantic ports.

A third railway is the so-called transcontinental line, that is to connect the capitals of Chile and the Argentine Republic. The line is finished with the exception of the tunnel necessary to the final passage of the Andes, and it will give a Pacific outlet to the important fruit and wine industries of Mendoza and San Juan, subtropical provinces at the foot of the Andes.

The wheat-growing and stock-raising industries are extending to the south and southwest, and including the lands of Patagonia. Railway extension is following these changes and the new southern port of Bahia Blanca is steadily increasing in importance. Already it is the center of several lines from the wheat district to the north and there is a prospect of the early completion of the line across the plains to the lake district in

the southwest. The more abundant rainfall in the vicinity of the Andes south of 40° south produces some forests and excellent pasture, promising good traffic for railways. In this section the port of Punta Arenas, on the Straits of Magellan, has risen to some importance of late, but the trade is largely local, being confined to the products of sheep ranches and some gold mines.

The continuation of the Andes, without intermission along the western Pacific Coast, forms at present an effectual barrier to extended communication on the land side, though numerous ocean ports afford outlets for shipment abroad of national products.—*Bulletin, International Bureau of American Republics.*

WATER TRANSPORTATION IN THE UNITED STATES.—The Census Bureau has recently issued Bulletin 91, dealing with the subject of Transportation by Water in the United States. It covers the year 1906, and takes account of vessels of over five tons burden, engaged in transportation on the inland and coast waters of the United States and dependencies. There were over 37,000 such vessels with a total gross tonnage of nearly 13,000,000 tons; larger than the entire merchant marine of any entire foreign power except the United Kingdom. This is an increase of 145 per cent. since 1889. A little over one-half of the vessels are engaged along the Atlantic and Gulf Coasts. In point of tonnage, however, our Great Lake fleet surpasses the Atlantic and Gulf fleet, almost one-half of the total tonnage being engaged on the Great Lakes. There has been a great increase in the number of steam vessels on our Atlantic, Pacific, and Gulf Coasts and on the Great Lakes, but an actual decrease on the Mississippi and its tributaries. The number of sailing vessels in use has not changed materially since 1889.

More than 330,000,000 passengers were carried on ferry boats during 1906, two-thirds of these being bound to and from New York City. Three-fourths of the steam vessels engaged in carrying freight and passengers are built of iron or steel. A notable difference in the character of the boats used on the Great Lakes and on the Mississippi is shown by the fact that 68 per cent. of the former are iron or steel while 99 per cent. of the latter are wooden.

The vessels engaged along the Atlantic and Gulf Coasts carried the largest tonnage of freight, with the Greak Lakes second. The tonnage of freight carried on the Great Lakes has increased from 25,000,000 tons to 75,000,000 since 1889, but has fallen off from 29,000,000 tons to 27,000,000 tons on the Mississippi and branches. Coal and petroleum are

by far the largest items of freight on the Atlantic side, petroleum the largest on the Pacific side, coal on the Mississippi, and iron ore and coal on the Great Lakes.

There are 3,644 miles of canals and canalized rivers in the United States; 887 miles have been abandoned since 1880 and 2,000 miles had been abandoned prior to 1880. Over 1,000 miles of canals and canalized rivers have been constructed since 1880.

The tonnage of freight carried through the American canals at Sault Ste. Marie has increased marvelously, from 14,500 tons in 1855, to 15,000,000 tons in 1895, to 46,000,000 tons in 1906. This canal carried three times the tonnage carried by the Suez Canal in that year. The tonnage of freight carried by the Erie Canal and its branches has decreased one-half since 1880. The New Jersey and Pennsylvania canals carry only a small fraction of their former traffic. The traffic on the canalized rivers, largely in the soft coal regions of Pennsylvania, West Virginia and Ohio, has grown enormously in recent years. R. H. W.

URUGUAY.—Uruguay has long been a buffer state, and like all countries so placed has been the scene of frequent conflict. The Rio de la Plata was discovered in 1516, and Buenos Aires was founded by the Spaniards in 1535. Rio Janeiro was discovered by Vespucci on January 1, 1501, and Brazil was settled by the Portuguese some thirty years later. Between the domain of the Spanish viceroyalty of Buenos Aires and the Portuguese colony of Brazil there lay a territory occupied by a race which neither Spain nor Portugal was able to subdue for many years. This was Uruguay, with its native Charruas, a branch of the great Tupi-Guarani family.

Brazil wanted this territory and claimed it; Buenos Aires wanted it and claimed it, while the natives preferred to keep it for their own and succeeded in doing so for more than a hundred years. During that time a three-cornered contest was carried on with only infrequent interruptions. During the latter part of the seventeenth century the Portuguese established themselves at a point on the north bank of the Plate nearly opposite Buenos Aires. While they were engaged in fortifying the town the Spaniards crossed the river in force and defeated them in a battle. A struggle in which first one and then the other was victor continued until 1777, when a vast Spanish army and fleet swept the Portuguese from a large area which they then held and the treaty of San Ildefonso determined the respective possessions in the *uti possidetis* basis. Spanish possession lasted only a few years.

The early part of the nineteenth century was a time of war and con-

fusion, of British conquest and Spanish expulsion of the British forces, of Argentina's declaration of independence and effort to include Uruguay in her territorial possessions, of Brazilian conquest of the disputed area, of Uruguay as a Brazilian province, and finally, of Uruguayan independence in 1828. From that time almost until the present Uruguay has been a storm center in which Brazil, Argentina and, at times, Paraguay have been involved. These activities have been interspersed with local revolts and armed revolutions, with plots against the Government and the establishment and overthrow of dictatorships. In the course of these lamentable experiences Uruguay has incurred a national debt somewhat exceeding $125,000,000.

Yet in spite of its turbulent history the country has developed in a surprising manner. Its area is 72,210 square miles, about twice that of the State of Indiana, and its population probably a little exceeds 1,000,000. Although comparatively sparsely populated, it has a larger population per square mile than any other South American country. Its location is one of great strategic importance, inasmuch as it virtually controls the entrance to the River Plate, a highly important gateway to Argentina, Paraguay and Bolivia. With the completion, probably within the next two years, of the Trans-Andean Railway the freedom of the Plate will also be of importance to Chile and Peru.

Uruguay has a delightful climate. A visitor has said that its summers are like our June and its winters like our October. It has hills but no mountains. Its surface is a well-watered expanse of undulating plains of great fertility. It has no dense forests, yet it has an ample supply of wood for all ordinary domestic purposes. The raising of sheep and cattle have been and still are the principal industries, and few countries in the world are better adapted to that purpose. Within recent years an increasing attention has been paid to agriculture. A vineyard, planted in 1874, proved so successful that many others were undertaken. Thousands of tons of grapes are now produced annually, a part being sold as fresh fruit and a part being converted into wine and alcohol. Olive culture is also becoming an important industry.

The cattle of Uruguay need no special care. The climate is mild. water is abundant and the widespread grazing lands are green throughout the year. Until recently cattle and sheep were allowed to run practically wild and were regarded as of value only for their hides and their wool. During recent years more attention has been paid to domestication, efforts have been made to improve breeds through the importation of better stock for breeding purposes, and a market for fresh meat has been developed in

addition to an already large market for jerked beef. Out of a total export of $38,500,000 in 1904 the products of the pasture and the range represented $35,000,000. The pastoral industries of the country give promise of increase, and Uruguay seems destined to prove an active rival in the beef and mutton markets of Europe, as well as a source of supply for wool and hides. An important share of Uruguay's pastoral interests is in the hands of foreigners. A report made in 1898 showed that of a total real estate valuation of $278,000,000 only a little more than half was held by Uruguayans. Italians held $35,000,000 worth of land, Spaniards $32,000,000 worth, Brazilians $30,000,000, French $16,000,000, with some $22,000,000 worth held by those of other countries.

Uruguay has some 1,200 or more miles of railway line centering in Montevideo. A line runs northward to the Brázilian border, while shorter lines run in other directions for distances of from 50 to 200 miles. Some of these carry a Government guarantee of interest on the investment. The railway system as at present planned will have cost when completed about $100,000,000. Connection will be made with the lines of Brazil on the north, with the lines of Argentina on the west, and, via Brazilian and Argentine lines, with Paraguay, 600 miles away. By a connection which will some day be made via Jujuy, in Argentina, and La Paz, in Bolivia, Montevideo will be one of the terminal points of the projected Pan-American Railway, and the time will come when an all-rail journey can be made from New York to the capital of Uruguay. The distance between those points by rail will be about 10,500 miles, and while the journey could be made by water more quickly, more comfortably and for much less money, the scenery along the water route leaves much to be desired. The scenery along the rail route is in many places beautiful and in many other places truly sublime.

The capital city, Montevideo, is a place of unusual attractiveness. Foreigners form nearly if not quite one-third of its present population of about 220,000. It is a rival and competitor of Buenos Aires, although the rapid development of Argentina and its capital has left Montevideo a long way behind. The place has no natural harbor, and a large sum of money is being expended in the construction of docks, piers and a breakwater. It has a large Italian and Spanish population, and the prevailing style of architecture is clearly Italian. Its location on a tongue of land which slopes from a central ridge to the shore on either hand, gives it excellent drainage, and thus makes it one of the most healthful cities of South America. It is a place of beautiful residences and lovely gardens, where the flowers blossom and the trees are green throughout the year.

Its society is cosmopolitan and pleasure-loving, given to entertainments, theatres and the race track. It is regarded by many as among the most delightful of the world's residence cities.

The commerce of the country is somewhat affected by its political and military disturbances, but it may be given at a general average of $25,000,000 a year for its imports and $35,000,000 to $40,000,000 a year for its exports. As already stated, its exports consist in large part of the products of the range and the pasture. Our trade for the calendar year 1905 was represented by $3,529,495 for imports and $2,703,761 for exports. The limitation of our export trade may be charged mainly to two influences. One is our failure to cultivate the market, and the other is the important advantage held by Europe in the matter of transportation facilities. Like Argentina, Uruguay has little that we can buy except hides, skins and wool. We have much that we might sell to her by the exercise of well-directed trade energy.

If Uruguay would abandon her revolutionary habits and settle down to peace and industry, her progress and development would doubtless be little short of marvelous.—*New York Sun.*

GEOGRAPHIC ACTIVITIES AT THE ILLINOIS STATE NORMAL UNIVERSITY.—The Geography Club of the Illinois State Normal University was organized in July, 1907, to promote "systematic reading of the best geographic literature; investigation of local geographic problems; coöperation for the improvement of teaching geography in the public schools." The club is reading, this year, Johnson's Mathematical Geography. The members will receive, from time to time, the Leaflets from the Geographical Museum recently inaugurated by the Institution. Leaflet Number One deals with The Traveling Museum: What It Is; How To Get It; and How To Use It.

A NEW OUTLINE MAP.—At the suggestion of Professor D. W. Johnson of Harvard University, the J. L. Hammett Company of Boston has recently issued a blank form for drawing a Mercator Outline Map of the World. The form is 13 x 11½ inches and includes latitude and longitude lines, equator, tropics and circles. It is available for use in practice or test sketching of any large world area.

THE CONTENT OF GEOGRAPHY.—It has been well said by an English geographer, H. R. Mill, that geography is the meeting-place of the physical and the human sciences, the focus at which the rays of natural science and those of history and economics converge to illuminate the earth in its relation to man. It is a generalization, a synthesis of units from many specialized sciences, units which, in this union, are viewed from their relations to man. Geography sets forth the relations existing between man and his physical environment, classifies and explains the influences and responses. Ritter has been called the founder of modern geography, and in the matter of definition for the science we have not gone far beyond his conception, that geography treats of the earth as the home of man. In this sentence the relative conjunction suggests that "the relation" is the key—the essential.

Herein are embraced a wide field and a wealth of material. Many facts and relations of the science are easily grasped and explained; many are quite abstruse. Much of the knowledge included is well known, but probably a larger share is yet unknown, or at least unclassified. Some of the relations are very complex, others equally simple. Of the subject-matter known, there is far too much to be learned in a common-school course, were it all of a character elementary enough to be comprehended by pupils of this age and attainment. Like other sciences, botany, zoölogy and mathematics, or like the humanities, history, politics and civics, it may well be begun in the elementary or secondary schools; and again like them, to be mastered, it must be continued into the higher institutions.

This last point is fully illustrated in the geographic study of a city. Its place relations are usually simple. It is on a river, bay or lake, or at the intersection of crossing highways, and hence engages in commerce; or it is near certain raw materials or possesses water power, and hence is a manufacturing center. But the intricate world relations of such cities as New York, London and Singapore are much more complicated. Why is it New York and not Boston that dominates American commerce? The latter is nearer Europe. Or why New York and not Philadelphia? The latter is a much more salubrious climate, is as near coal and iron-producing areas, and has an open water route to the sea. In order to appreciate fully New York's advantage, the student must have a good knowledge of the physiography and resources of the whole region. To excel in the export trade, Boston should not only have been nearer Europe but should have had as easy a route to the agricultural Middle West and the manufacturing Middle Atlantic States as had New York. It was in an attempt to attain this advantage that the marvelous five-mile Hoosac tunnel

was made. But even then the grade was not so easy and the route not so direct as to New York. At New York, the ancient highlands, the old Appalachians, are narrower than at any other place between Savannah and the St. Lawrence; and the easy grade up the drowned Hudson and leveled Mohawk valleys and along the old Ontario lake bottoms gave the metropolis, in her trade with the West, decided advantage over any other city. Her central position among the Atlantic States, and her easily accessible fruit and vegetable lands in New Jersey and Delaware, gave her further advantage. New York's harbor was essentially perfect, being at the mouth of a drowned, deep valley, but Philadelphia's needed much and continuous attention, because the valley, which had been drowned to make Delaware Bay, was a shallow one in a recent coastal plain of soft strata and not a deep one in ancient, hard rocks.

A second illustration may be taken from a study of the tropics. Elementary pupils will describe the main features of a tropical climate and will name rubber, mahogany and tropical fruits as products of the zone, and even recite that the equatorial belt is unhealthful for men; but the geographic factors in the problem of acclimatization, and the adjustments to the climate which may be made, can not be apprehended without more than elementary preparation. Such scientific knowledge and training are required to understand the influence of altitude on climate, effects of exposure to sunshine, distribution and geographical relations of tropical diseases, sanitation and the adjustment to foods and clothing which the tropics make necessary or furnish. A consideration of these illustrations reveals the intricacy of some geographic problems.

Not only has geography complex and intricate problems for advanced study, but there is also a vast amount of geographic truth yet to be discovered and classified. As will be shown in the following paragraphs, multitudes of opportunities for research exist within the scope of this science.

There are large, habitable countries about which expert geographers, even now, know but little. In this list belong central Canada, central Siberia, part of the Sudan, southern Brazil, eastern Bolivia, Peru and Ecuador, much of Colombia, the Guianas and Venezuela and the Central American States. And less habitable areas comprise as many more millions of square miles of *terra incognita:* viz., parts of the Sahara and Sudan, central Africa, most of the Amazon country, central Asia, central Australia and the two polar regions. Pioneer exploration is yet to be done.

Even in well-settled lands on both sides of the Atlantic new facts concerning geographic influence are continually coming to light, and no doubt many principles will yet be discovered whose presence and operation

are none the less real because unknown, and whose recognition will be beneficial to man. Certainly new applications and illustrations of more or less familiar laws may be found in abundance. It was known years ago that if a vessel entered the Cape Horn passage from the Atlantic with a certain wind she had little difficulty in reaching the Pacific, while if she chose any other wind, the course was fraught with great difficulties. But not until there had been made extended studies of cyclones and their geographic distribution, movements, etc., was there revealed the reason for occasional safe passages and more frequent unsafe ones. The cognizance of this geographic fact and its influence have been of inestimable value to inter-oceanic commerce. Industrial and commercial history furnish frequent similar examples.—From article on College Geography in *Educational Review*, April, 1908.

Ostrich Farming.—The export of ostrich feathers from South Africa is steadily increasing. During the past year (1906) 547,709 lbs. of feathers, of a value of £1,406,159, were sent away. So valuable is this industry becoming to Cape Colony that in order to better protect it the Cape government is bringing in a bill to prohibit the exportation of ostriches and ostrich eggs. Although for some years past a duty of £100 has been levied on every ostrich taken out of the Colony, and £5 on every egg exported, it is stated that this has not quite prevented exportation. The bill now before the House makes it unlawful to send an ostrich out of the country, and provides the very severe penalty of imprisonment for a year or more.

Ostrich farming in South Africa is pretty well confined to the Cape, only a comparatively small number of birds being kept in the other colonies.

The best quality feathers are obtained from the wild birds, and it appears that the more the birds are confined the more likely is the plumage to depreciate in quality. On the other hand, when the birds are kept in small areas and well fed, they yield much heavier pluckings. From information obtained from several of the leading ostrich farmers, I gathered that on the large runs the average plucking was worth about £3 per bird, and on the cultivated areas the average would be about £4 10s.—*Agricultural Gazette of New South Wales.*